

## NOTES ON GEOGRAPHIC DISTRIBUTION

### Insecta, Ephemeroptera: Range extensions and new state records from far western Montana, U.S.A.

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The U.S.A. state of Montana is the third largest in size (380,838 km<sup>2</sup>) of the conterminous states but has been one of the poorest known states in terms of its specific Ephemeroptera (mayfly) fauna (McCafferty 2001).

This note represents a considerable step towards rectifying that situation by providing new record data for species collected in the far western Rocky Mountain region of Montana. The exact study area to which our new data apply includes all of Montana west of the Continental Divide, and all of Glacier National Park, which in the north extends both west and east of the Continental Divide (Figure 1). Thus, locales in the Montana records herein are from Deer Lodge, Flathead, Glacier, Granite, Lake, Lewis and Clark, Lincoln, Mineral, Missoula, Powell, Ravalli, Sanders, and Silver Bow Counties. We contribute new Montana record data for 38 species. Previously, 49 species were known from western Montana based on published data, with Traver (1934; 1935) being the major provider of previous records.

The present work brings the total number of Ephemeroptera species for western Montana to 87, although in the past some other species may have been listed without confirming data or may have appeared in unpublished reports, or grey literature. It is not our policy in establishing faunal inventories to recognize species listed without accompanying data (see McCafferty 2000), nor is it the policy of *Check List* to include species appearing in grey literature.



**Figure 1.** Western Montana study area; location within U.S.A., and pertinent landmarks.

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In the record data given herein, the larval stage of the species applies, unless adults as (A) or adults and larvae as (A, L) are indicated with the date of collection. Bracketed acronyms for material depositions are as follows: Bureau of Land Management/Utah State University National Aquatic Monitoring Center BugLab, Logan, Utah [BLAB]; Confederated Kootenai-Salish Tribes Fisheries Department, Polson, Montana [CKST]; Cornell University Arthropod Collection, Ithaca, New York [CUAC]; University of Montana Flathead Lake Biological Station Reference Collection, Polson, Montana [FLBS]; United States Field and Wildlife Services vouchers at Flathead Lake Biological Station [FWS]; Illinois

Natural History Survey, Urbana, Illinois [INHS]; Montana Department of Environmental Quality vouchers held at Rhithron and Associates, Missoula, Montana [MDEQ]; Montana Fish, Wildlife, and Parks, Kalispell, Montana [MFWP]; Biology Department, Montana Tech of the University of Montana, Butte, Montana [MTB]; Purdue Entomological Research Collection, West Lafayette, Indiana [PERC]; and United States Geological Service vouchers held at Flathead Lake Biological Station [USGS]. Taxa are listed in alphabetical order, and for some of the species, data are followed by additional comments. Representative rather than comprehensive data are given for relatively common species in the area of study.

### AMELETIDAE

#### *Ameletus pritchardi* Zloty.

FLATHEAD COUNTY: Avalanche Creek, Glacier National Park, 9-V-1969, A. Gaufin [PERC], and Middle Fork Flathead River, 10-IX-2003, M. Anderson [MTB]. These data also represent the first U.S.A. records for this species.

#### *Ameletus subnotatus* Eaton.

FLATHEAD COUNTY: Hungry Horse Creek, (A) 12-V-2005, R. Newell [FLBS]; LINCOLN COUNTY: Fisher River, 24-II-2005, R. Newell [FLBS]; MISSOULA COUNTY: Lolo Creek, 0.6 mi northeast of Lolo Pass, 46°38'37" N 114°34'44" W, 28-VII-2002, P. McCafferty, L. Jacobus [PERC]; SANDERS COUNTY: Clark Fork River, 10 mi south St. Regis, (A) 17-IV-2004, R. Newell [FLBS].

#### *Ameletus suffusus* McDunnough.

FLATHEAD COUNTY, Middle Fork Flathead River floodplain ponds, 13-VIII-2002, S. Collins [FLBS].

#### *Ameletus velox* Dodds.

FLATHEAD COUNTY: Coal Creek, Glacier National Park, 27-IX-1978 [FWS], and Quartz Creek, Glacier National Park, 7-VII-1979 [PERC]; GLACIER COUNTY: Lake Josephine, Glacier National Park, 22-VI-2006, R. Newell [FLBS]; MINERAL COUNTY: Trout Creek, 26-III-2005, R. Newell [FLBS]; MISSOULA COUNTY: Lolo Creek, 19-V-2005, R. Newell [FLBS]; SANDERS: Big Thompson River, 2-IV-2005, R. Newell [FLBS].

### BAETIDAE

#### *Acentrella insignicans* (McDunnough).

DEER LODGE COUNTY: Clark Fork River, at Dempsey, below Warmsprings Creek, and Silver Bow Creek, below Warmsprings Ponds, 18-VIII-2000 [MDEQ]; FLATHEAD COUNTY: Middle Fork Flathead River, 23-VII-1988, J. Ward [FLBS]; GRANITE COUNTY: Clark Fork River, at Deer Lodge, and Little Blackfoot River, 17-VIII-2000 [MDEQ]; LAKE COUNTY, Mission Creek, 23-VIII-2005, R. Newell [FLBS]; LINCOLN COUNTY, Fisher River, 20-VIII-2000, R. Newell [FLBS]; MINERAL COUNTY, Clark Fork River, near Superior, 15-VIII-2000 [MDEQ]; MISSOULA COUNTY, Bitterroot River, near mouth, and Blackfoot River, near mouth, 14-VIII-2000 [MDEQ], and Clark Fork River, 15 miles southeast Missoula, 22-VI-1949, L Nielsen [PERC]; RAVALLI COUNTY: Bitterroot R, at Darby, and at Hamilton, and East Fork Bitterroot River, 1-IX-2005, R. Newell [FLBS]; SANDERS COUNTY: Clark Fork River, above Flathead River, and above Thompson Falls Reservoir, 15-VIII-2000 [MDEQ].

#### *Acentrella turbida* (McDunnough).

DEER LODGE COUNTY, Deep Creek, 7-VII-2005 [BLAB]; FLATHEAD COUNTY, Crazy Beaver Spring, 12-IX-03, M. Anderson [MTB]; GLACIER COUNTY, St. Mary Lake, Glacier National Park, 17-VII-2006, R. Newell [FLBS]; LAKE COUNTY, Mission Creek, 23-VIII-2005, R. Newell [FLBS]; LINCOLN COUNTY, Fisher River, 0.5 miles from mouth, 20-VIII-2005, R. Newell [FLBS]; MISSOULA COUNTY, Bitterroot River, 5 miles south of Lolo, 26-VIII-2005, and Rock Creek, 18-VIII-2005, R. Newell [FLBS]; RAVALLI COUNTY, Bitterroot River, at

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Hamilton, and at Darby, 1-IX-2005, R. Newell [FLBS]. McDunnough (1924) described this species from the "Waterton Lakes" area of Alberta, Canada, which lies just north of the Alberta-Montana (Glacier County) border. There is no evidence, however, that the material was from Waterton Lake itself, which is shared by Alberta and Montana. Furthermore, this species is not known to be lacustrine.

### *Acerpenna pygmaea* (Hagen).

FLATHEAD COUNTY, Stillwater River, at Olney, 5-V-2007, R. Newell [FLBS, PERC]. This transcontinental species is now known from most northwestern United States, as well as Alberta and Saskatchewan (McCafferty and Meyer 2007).

### *Baetis bicaudatus* Dodds.

FLATHEAD COUNTY, Fish Creek, and McDonald Creek, at McDonald Falls, Glacier National Park, 6-VII-2006, R. Newell [FLBS]; GLACIER COUNTY, Wilbur Creek, near campground, Glacier National Park, 11-VII-1965, A. Gaufin [PERC], and Cataract Creek, and Lake Shelburne, Glacier National Park, 18-VII-2006, R. Newell [FLBS]; LAKE COUNTY, Mission Creek, and Power Creek, 31-III-2005, R. Newell [FLBS]; LINCOLN COUNTY, Stillwater River, 7-IV-2005, R. Newell [FLBS]; MINERAL COUNTY, Van Ness Creek, 26-III-2005, R. Newell [FLBS]; MISSOULA COUNTY, Lolo Creek, 0.6 miles, northeast Lolo Pass, 46°38'37"N 114°34'44"W, 28-VII-2002, P. McCafferty, L. Jacobus [PERC]; RAVALLI COUNTY, Skalkaho Creek, 23-VII-2005, R. Newell [FLBS]; SANDERS COUNTY, Magpie Creek, 26-III-2005, and Revais Creek, 1-III-2005, and Seepay Creek, 26-IV-2005, R. Newell [FLBS].

### *Baetis flavistriga* McDunnough.

FLATHEAD COUNTY, Bowman Lake outlet, and McDonald Creek, Glacier National Park, 6-VII-2006, R. Newell, and Middle Fork Flathead River, at Nyack Floodplain Ponds, 6-VIII-2002, S. Collins [FLBS]; LAKE COUNTY, Mission Creek, at Moiese, 18-IX-2002, 12-III-2005, R. Newell [FLBS].

### *Callibaetis fluctuans* (Walsh).

RAVALLI COUNTY, 10 miles south of Darby, (A) 25-VIII-1964, G. Edmunds [PERC].

### *Centroptilum bifurcatum* McDunnough.

FLATHEAD COUNTY, Flathead Lake, 8-VII-2005, R. Newell [FLBS]; GLACIER COUNTY, Fisher Cap Lake, Glacier National Park, 17-VII-2006, R. Newell [FLBS]; LAKE COUNTY, Flathead Lake, 8-VII-2005, S. Collins [FLBS]; LINCOLN COUNTY, Barron Creek, 29-VII-2003 [BLAB]. This species was originally described by McDunnough (1924) from the "Waterton Lakes" area of Alberta, Canada, which lies immediately north of the Alberta-Montana (Glacier County) border. There is no evidence, however, that it was taken from Waterton Lake itself, which is shared by Alberta and Montana.

### *Centroptilum conturbatum* McDunnough.

FLATHEAD COUNTY, Floodplain ponds at Nyack, 2-VIII-2002, S. Collins, and Kintla Lake, Glacier National Park, 6-VII-2006, and Lake McDonald, Glacier National Park, 6-VIII-2006, R. Newell [FLBS]; GLACIER COUNTY, Josephine Lake, Glacier National Park, 18-VII-2006, R. Newell [FLBS].

### *Heterocloeon anoka* (Daggy).

DEER LODGE COUNTY, Clark Fork River, at Demsey, and below Warmsprings Creek, and Mill-Willow Creeks bypass, and Silver Bow Creek, below Warmsprings Ponds, 18-VIII-2000 [MDEQ]; GRANITE COUNTY, Clark Fork River, above Little Blackfoot River, and at Deer Lodge, and at Gold Creek Bridge, 17-VIII-2000 [MDEQ]; LAKE COUNTY, Mission Creek, at Moiese, 18-IX-2002, R Newell [FLBS]; MISSOULA COUNTY, Clark Fork River, at Bonita, 16-VIII-2000 [MDEQ]; SILVER BOW COUNTY, Silver Bow Creek, above Butte, 18-VIII-2000 [MDEQ]. This species was recently shown by McCafferty and Meyer (2007) to have a transcontinental distribution pattern, and in the West historically to have been misidentified as *Plauditus punctiventris* (McDunnough).

### *Procloeon pennulatum* (Eaton).

FLATHEAD COUNTY, Lake McDonald, Glacier National Park, S. Varrellman, and Tally Lake, (A,L) 3-X-2006, M. Koopal [FLBS]; LAKE COUNTY, Flathead Lake, at Yellow Bay, 8-VII-2005, R. Newell [FLBS].

### *Pseudocloeon propinquum* (Walsh).

LINCOLN COUNTY, West Branch Big Creek, 14-VII-2003 [BLAB]. This species was recently shown to have a transcontinental distribution pattern reaching to the West Coast (McCafferty and Meyer 2007).

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### BAETISCIDAE

*Baetisca columbiana* Edmunds.

SANDERS COUNTY, Flathead River, below Seepay Creek, approximatley 3 miles downstream of Perma, 23-XI-2004, R. Newell [CKST], and 4-IV-2006, R. Newell [FLBS]. This species is restricted to western North America (Alberta, Idaho, Saskatchewan, Washington, and now Montana), where evidently it is only rarely taken (see Webb and McCafferty 2004, Webb et al. 2004).

### CAENIDAE

*Caenis latipennis* Banks.

MISSOULA COUNTY, Rainy Lake, (A) 13-VIII-1989, D. Gustafson [PERC].

### EPHEMERELLIDAE

*Drunella pelosa* (Mayo).

FLATHEAD COUNTY, Bowman Creek, Glacier National Park, 20-VI-2007, C. Backsen [FLBS].

### HEPTAGENIIDAE

*Cinygma dimicki* McDunnough.

FLATHEAD COUNTY, Mineral Creek, Glacier National Park, (A) 6,22-IX-1995, J. Giersch [FLBS]; LAKE COUNTY, Lost Creek, Highway 83, (A) 22-VI-1982 [FLBS].

*Cinygma integrum* Eaton.

LAKE COUNTY, Yellow By Creek, (A,L) 4,8-VIII-1983, M. Spies [FLBS]; MISSOULA COUNTY, Lolo Creek, 0.6 miles northeast Lolo Pass, 46°38'37"N, 114°34'44"W, 28-VII-2002, P. McCafferty, L. Jacobus [PERC].

*Cinygmula gartrelli* McDunnough.

FLATHEAD COUNTY, McDonald Creek, (A) 12-VII-2006, R. Newell [FLBS]; RAVALLI COUNTY, Fern Creek, at Highway 93, south of Hamilton, (A) 4-IV-1969, A. Gaufin [PERC].

*Cinygmula par* (Eaton).

FLATHEAD COUNTY, McDonald Creek, (A), 5-VII-1993, and Reynolds Creek, Glacier National Park, (A) 14-IX-1997, J. Giersch, and Upper Kintla Lake, (A) 4-VIII-1978, J. Stanford, and North Fork Flathead River, Springbrook, (A) 12-IX-2006 [FLBS]; GLACIER COUNTY, tributary of Wilbur Creek, at Iceberg Lake Trail, Glacier National Park, (A) 29-VII-1969, A. Gaufin [PERC]; SANDERS, Weaksville Creek, 2 miles north of Highway 200, (A) 26-V-, 4-VI-2005, R. Newell [FLBS].

*Cinygmula ramaleyi* (Dodds).

FLATHEAD COUNTY, Park Creek, Glacier National Park, (A) 26-VIII-1932 [CUAC]; LAKE COUNTY, Yellow Bay Creek, (A) 29-X-1981, J. Stanford [FLBS]; SANDERS COUNTY, Big Thompson River, (A) 2-IV-2005, R. Newell [FLBS].

*Cinygmula reticulata* McDunnough.

FLATHEAD COUNTY, confluence of Fish Creek and McDonald Creek, Glacier National Park, (A) 9-VII-1965, A. Gaufin [PERC]; GLACIER COUNTY, Two Medicine Creek, at Trick Falls, Glacier National Park, (A) 22-VII-1968, A. Gaufin [PERC]; MISSOULA COUNTY, Rock Creek, at Valley-of-the-Moon Road, (A) 3-IV-2005, R. Newell [FLBS]; SANDERS COUNTY, Big Thompson River, (A) 2-IV-2005, R. Newell [FLBS].

*Epeorus deceptivus* (McDunnough).

FLATHEAD COUNTY, Glacier National Park: Camas Creek, 5-VI-1978, and Park Creek, 26-IX-1978, and Sage Creek, 8-VII-1978, and Spruce Creek, 16-IX-1981, and Starvation Creek, 5-VI-1978 [FWS]; GLACIER COUNTY, Roes Creek, at Rising Sun Campground, Glacier National Park, 19-IX-1968, R. Baumann [PERC]; LAKE COUNTY, Jocko Valley, near Arlee, (A) 11-X-1931 [PERC].

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### *Ironodes nitidus* (Eaton).

LAKE COUNTY, Power Creek, 31-III-2005, and Station Creek, 6-III-2005, and Talking Water Creek, at Highway 35, 20-IV-2005, R. Newell [FLBS]; SANDERS COUNTY, Magpie Creek, 26-III-2005, and Revais Creek, 1-III-2005, and Weaksville Creek, 2-IV-2005, R. Newell [FLBS].

### *Rhithrogena futilis* McDunnough

GLACIER COUNTY, Trick Falls, Glacier National Park, (A) 13-VII-1940 [INHS].

### *Rhithrogena hageni* Eaton.

DEER LODGE COUNTY, Big Hole River, 27 miles southeast Wisdom, (A) 18-VI-1969, R. Frank [PERC]; FLATHEAD COUNTY, Camas Creek, North Fork Road, Glacier National Park, (A) 9-VII-1965, A. Gaufin [PERC]; GLACIER COUNTY, Cutbank Creek, at Highway 89, (A) 18-VII-1965, A. Gaufin [PERC]; MISSOULA COUNTY, Lolo Creek, and Rock Creek, 3-IV-2005, R. Newell [FLBS].

### *Rhithrogena robusta* Dodds.

FLATHEAD COUNTY, Glacier National Park: Harrison Creek, and Lincoln Creek, and Muir Creek, and Ole Creek, 2-VI-1978, and Spruce Creek, 6-VII-1978, and Starvation Creek, 13-IV-1977 [FWS]; GLACIER COUNTY, Wild Creek, St. Mary's Campground, Glacier National Park, 6-VII-1963, A. Gaufin [PERC]; LAKE COUNTY, Jocko River, 1-III-2005, R. Newell [FLBS]; SANDERS COUNTY, Vermilion River, 2-IV-2005, R. Newell [FLBS].

## LEPTOHYPHIDAE

### *Asioplax edmundsi* (Allen).

MISSOULA COUNTY, Clark Fork River, VIII-2004 [MDEQ]. This seldom taken western species has more recently also been found in the prairie region of Montana (Powder River County, Powder River, at Broadus, 19-VII-2005 [BLAB]).

## LEPTOPHLEBIIDAE

### *Paraleptophlebia debilis* (Walker).

FLATHEAD COUNTY, Lake McDonald, Glacier National Park, (A) 21-VIII-1932 [CUAC]; GLACIER COUNTY, Lost Lake, 2-IX-2001, M. Anderson [FLBS]; LAKE COUNTY, Jocko River, and Mission Creek, 23-VIII-2005, R. Newell [FLBS]; MISSOULA COUNTY, Morrell Creek, near Seely Lake, 18-VIII-1964 [PERC]; MINERAL COUNTY, Cedar R, 26-VIII-2005, R. Newell [FLBS]; SANDERS COUNTY, Henry Creek, near confluence with Clark Fork, 17-V-1969, A. Gaufin [PERC].

### *Paraleptophlebia heteronea* (McDunnough).

FLATHEAD COUNTY, Lake McDonald, Glacier National Park, (A) 21-VIII-1932 [CUAC]; GLACIER COUNTY, Two Medicine Creek, (A) 25-VII-1980, J. Stanford [FLBS]; LAKE COUNTY, Yellow Bay, Flathead Lake, (A) 10-VIII-1964, L. Nielsen [PERC]. This species was originally described by McDunnough (1924) from the "Waterton Lakes" area of Alberta, Canada, which lies immediately north of the Alberta-Montana (Glacier County) border. There is no evidence, however, that it was taken from Waterton Lake itself, which is shared by Alberta and Montana.

### *Paraleptophlebia temporalis* (McDunnough).

GLACIER COUNTY, Cutbank Creek, Highway 89, (A) 18-VII-1965, A. Gaufin [PERC]; MISSOULA COUNTY, Blackfoot River, Highway 20 west of Junction with Highway 209, (A) 8-VII-1964 [PERC].

### *Paraleptophlebia vaciva* (Eaton).

FLATHEAD COUNTY, Sage Creek, Glacier National Park, 25-III-1981 [FWS]; GLACIER COUNTY, Lake Josephine, Glacier National Park, 22-VI-2006, A. Farwick [FLBS]; LINCOLN COUNTY, Fisher River, at Highway 93, 24-II-2005, R. Newell [FLBS]; MINERAL COUNTY, Trout Creek, 26-III-2005, R. Newell [FLBS]; MISSOULA COUNTY, Lolo Creek, 19-V-2005, R. Newell [FLBS]; SANDERS COUNTY, Weaksville Creek, 2-IV-2005, R. Newell [FLBS].

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### SIPHONURIDAE

*Parameletus columbiae* McDunnough.

FLATHEAD COUNTY, Middle Fork Flathead River, floodplain pond, 13-VI-2002, S. Collins [FLBS].

*Siphlonurus autumnalis* McDunnough.

FLATHEAD COUNTY, Crazy Beaver Spring, at Nyack, (larvae and male subimago) 12-IX-2003, M. Anderson [PERC], and Cut Bank Spring, at Nyack, Middle Fork Flathead River, at Nyack, 3-IX-2003, M. Anderson, S. Collins, and 6-X-2003, M. Anderson, and Wally Spring, at Nyack, 3-IX-2003, M. Anderson [FLBS]; GLACIER COUNTY, Fisher Cap Lake, and Swiftcurrent Lake, Glacier National Park, 17-VII-2006, and Josephine Lake, Glacier National Park, 18-VII-2006, R. Newell, and Waterton Lake, Glacier National Park, 19-VII-2006, A. Farwick [FLBS].

*Siphlonurus columbianus* McDunnough.

POWELL COUNTY, Nevada Creek, at State Road 141, 12 miles north Avon, 46°45'28"N, 112°42'15"W, 28-VII-2002, P. McCafferty, L. Jacobus [PERC].

*Siplonurus phyllis* McDunnough.

FLATHEAD COUNTY, unnamed pond near West Glacier, Glacier National Park, 7-VI-2006 [USGS, PERC]; GLACIER COUNTY, unnamed ponds, and beaver ponds (Belly River and Waterton River Drainages), 21-VII-2006 [USGS].

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